The small unit size meant the PICO device could be fixed in place on the outside of the patient’s split cast, making it minimally intrusive and avoiding any issues of entanglement with the tubing connecting the device and the dressing.

Results

Day 18

The PICO NPWT dressings were left in situ for two days at which time the wounds were re-assessed. Both wounds showed some evidence of improvement (see Figure 1) and the therapy was proved highly acceptable to the patient. Hence PICO was re-applied as previously.

Discussion

In this case an initial surgical intervention, three subsequent surgical interventions and the use of an antimicrobial dressing had failed to achieve any progress toward wound closure and both wounds were now approaching closure.

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In this case an initial surgical intervention, three subsequent surgical interventions and the use of conventional adhesive dressings had failed to achieve any progress toward wound closure and both wounds were now approaching closure.

In examining this case, one is prompted to question whether the earlier application of single-use NPWT would have been effective in avoiding the surgical interventions which were undertaken in the face of the wounds’ failure to improve. It is impossible to determine exactly what would have occurred had single-use NPWT been applied immediately after the initial surgical intervention.

However, if it is assumed that the progress achieved following the application of NPWT immediately post-op would mirror the pattern of improvement seen in this case when NPWT was applied a later time point, the theoretical implications of early intervention for time to discharge, time to healing and the associated costs can be determined.

In this way it is possible to estimate the potential value that could have been gained by the early application of an active interventional wound management approach such as NPWT in this case.

A theoretical analysis of the cost implications following early intervention compared with the pattern of care illustrated in this case study is given below.

Method

The wounds had so far failed to progress during the course of the eight days since the initial surgery was performed. In view of any of the three subsequent surgical interventions. Consequently a referral was made to the Wound Care Team to draw upon their expertise to determine if a different wound management approach could yield any progress toward healing.

Day 14: Specialist assessment

The patient was assessed by the Wound Care Team four days after the initial injury (12 days after the initial surgical procedure had been performed). At this point both wound beds comprised exposed tendinous tissue and unhealthy granulation tissue which was falling to advance. Consequently both wounds remained static with no progression being made towards healing via secondary intention. The patient was still experiencing considerable wound-associated pain and the affected limb exhibited marked oedema.

The static nature of the wound raised suspicions that an elevated bacterial burden was present within the wound bed and perhaps contributing to the failure of the wound to progress. As an immediate measure to address this the liquid nanocrystalline silver barrier dressings were applied to both wound beds. A bandage was applied as a means of dressing retention.

Following resolution of the problematic bacterial burden the long-term goal was to encourage the patient to mobilise and facilitate progression of the wound to closure via secondary intention.

The wound would be managed by the Wound Care Team the next day (rather than 12-days post the initial procedure). It was also assumed that as per the case study the initial treatment initiated by the Wound Care Team would be a silver barrier dressing and retention bandage for one day followed by the Initiation of NPWT. PICO NPWT would therefore be initiated two days after the initial surgery rather than some 13-days after the initial surgery as in the case study. The final assumption is that the wound would respond to PICO NPWT in the same manner as in the case study, allowing discharge six days after PICO initiation.

The theoretical analysis suggests there would be a marginal reduction in material costs following an early NPWT intervention approach (5%). However the major advantage of early intervention with PICO would be in the other costs, in this instance the avoidance of recurrent episodes of surgical debridement and a reduction in the length of in-patient stay. This results in a dramatic reduction in the overall cost of treatment (55%).

Cost Analysis

Costs associated with the management approach detailed within the case study were first calculated by applying appropriate unit costs (see Table 1) to the use of resources (see Table 2).

These were compared with the theoretical costs associated with an early intervention approach to managing the wound. In this case it was assumed that following the initial surgical procedure the wound would be reviewed by the Wound Care Team the next day rather than 13-days post the initial procedure. It was also assumed that as per the case study the initial treatment initiated by the Wound Care Team would be a silver barrier dressing and retention bandage for one day followed by the Initiation of NPWT. PICO NPWT would therefore be initiated two days after the initial surgery rather than some 13-days after the initial surgery as in the case study. The final assumption is that the wound would respond to PICO NPWT in the same manner as in the case study, allowing discharge six days after PICO initiation.

The commencement of this new regimen not only arrested the progressive worsening in the condition of the wounds which had occurred over the previous eight days but also saw the wound improve.

This improvement was achieved over a short period of time and was such that the patient was discharged from hospital six days after the Wound Care Team initiated treatment.

In examining this case, one is prompted to question whether the earlier application of single-use NPWT would have been effective in avoiding the surgical interventions which were undertaken in the face of the wounds’ failure to improve. It is impossible to determine exactly what would have occurred had single-use NPWT been applied immediately after the initial surgical intervention.

However, if it is assumed that the progress achieved following the application of NPWT immediately post-op would mirror the pattern of improvement seen in this case when NPWT was applied a later time point, the theoretical implications of early intervention for time to discharge, time to healing and the associated costs can be determined.

In this way it is possible to estimate the potential value that could have been gained by the early application of an active interventional wound management approach such as NPWT in this case.

A theoretical analysis of the cost implications following early intervention compared with the pattern of care illustrated in this case study is given below.

Table 1: Unit costs

<table>
<thead>
<tr>
<th>Case study approach</th>
<th>Theoretical early intervention approach</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vascular debridement</td>
<td>£2119.00</td>
</tr>
<tr>
<td>Antimicrobial dressing</td>
<td>£250.00</td>
</tr>
<tr>
<td>Retention bandage</td>
<td>£4.28</td>
</tr>
<tr>
<td>Other costs</td>
<td>£5.72</td>
</tr>
<tr>
<td>Total cost</td>
<td>£2424.90</td>
</tr>
</tbody>
</table>

Table 2: Cost Analysis

<table>
<thead>
<tr>
<th>Case Study Approach</th>
<th>Theoretical Early Intervention Approach</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other cost reduction</td>
<td>£1300.00 (55%)</td>
</tr>
<tr>
<td>Total cost reduction</td>
<td>£1300.00</td>
</tr>
<tr>
<td>Total cost</td>
<td>£1124.90</td>
</tr>
</tbody>
</table>

The small unit size meant the PICO device could be fixed in place on the outside of the patient’s split cast, making it minimally intrusive and avoiding any issues of entanglement with the tubing connecting the device and the dressing.

Results

Day 18

The PICO NPWT dressings were left in situ for two days at which time the wounds were re-assessed. Both wounds showed some evidence of improvement (see Figure 1) and the therapy was proved highly acceptable to the patient. Hence PICO was re-applied as previously.

Figure 1: Lateral and medial wounds following two days of NPWT

Day 21

A further wound re-assessment was performed three days later. At this time the wounds showed considerable improvement compared with the first treatment initiated by the Wound Care Team and indicated that both wounds had been reduced in size with a more healthy appearance to the wound bed. The improvements were so substantial that the patient was deemed suitable for discharge with the wound being reviewed on a weekly basis in the outpatients department.

Outpatient management

Following discharge PICO single-use NPWT was continued with the patient returning to the outpatients department for wound re-assessment and NPWT re-appraisal on a weekly basis. The weekly outpatient visits were supplemented with visits by the Wound Care Staff who changed the PICO NPWT dressing as necessary.

Day 28: Outpatient re-assessment

The initial outpatient review took place one week after the patient was discharged, at which point PICO NPWT had been in use for thirteen days. Re-assessment revealed that the improvement in the condition of both wounds that had been achieved since the initiation of PICO NPWT had been maintained (see Figure 2). In both cases the size and depth of the wounds was observed to have reduced during the seven days since discharge. The fact that both the wounds had continued to progress towards healing since discharge was all the more pleasing and remarkable given that at this time the patient reported that he had also returned to work following his discharge.

Figure 2: Lateral and medial wounds one week after discharge following thirteen days of PICO NPWT

The wounds continued to improve and PICO NPWT was discontinued once the wound size and exudate level were appropriate for management with conventional advanced wound management dressings. Subsequent management has successfully maintained progression toward healing and both wounds are now approaching closure.

Method

The wounds had so far failed to progress during the course of the eight days since the initial surgery was performed. In view of any of the three subsequent surgical interventions. Consequently a referral was made to the Wound Care Team to draw upon their expertise to determine if a different wound management approach could yield any progress toward healing.

Day 14: Specialist assessment

The patient was assessed by the Wound Care Team four days after the initial injury (12 days after the initial surgical procedure had been performed). At this point both wound beds comprised exposed tendinous tissue and unhealthy granulation tissue which was falling to advance. Consequently both wounds remained static with no progression being made towards healing via secondary intention. The patient was still experiencing considerable wound-associated pain and the affected limb exhibited marked oedema.

The static nature of the wound raised suspicions that an elevated bacterial burden was present within the wound bed and perhaps contributing to the failure of the wound to progress. As an immediate measure to address this non-adherent liquid nanocrystalline silver barrier dressings were applied to both wound beds. A bandage was applied as a means of dressing retention.

Following resolution of the problematic bacterial burden the long-term goal was to encourage the proliferation of granulation tissue and facilitate progression of the wound to closure via secondary intention. It was thought that Negative Pressure Wound Therapy (NPWT) would therefore be the most suitable intervention since this therapy is effective in fostering the development of granulation tissue as essential to wound progression but which had thus far failed to occur with conventional dressings and would therefore be achieved with the application of NPWT.

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